Why effects of social capital on health status differ between genders: considering the labor market condition

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Abstract

This paper explores how social capital is related with self-rated health status in Japan and how this relationship is affected by gender, using data for 3075 adult participants in the 2000 Social Policy and Social Consciousness (SPSC) survey. Controlling for endogenous bias, unobserved city size- and area-specific fixed effects, I find that social capital has a significant positive influence on health status for females but not for males. If samples are limited to persons with a job, social capital effects drastically decrease and the difference between genders diminishes. This empirical study provides evidence that people without a job can afford to allocate time to accumulate social capital and thereby improve their health status.

JEL classification: I19; J22; Z13

Keywords: health status, social capital, labor market.

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1. Introduction

Many empirical analyses have presented evidence that social capital has a critical influence on health-related behaviors and related outcomes (e.g., Costa-Font and Mladovsky, 2008; Islam, 2008; Laporte et al., 2008; Scheffler and Brown, 2008). The investigation of the relation between health status and social capital is currently one of the major topics in economic policy research. Although positive relationships between health status and social capital have been observed in some studies (e.g., Kawachi et al., 1997; 1999; Islam et al., 2006; Petrou and Kupek, 2008), others do not report positive associations (Iversen 2008). Most existing literature has failed to consider the reasons why the relationship between social capital and health status varies, from the point of view of economics[1]. An individual's decision to accumulate social capital can be explained by a standard optimal investment model (Glaeser et al., 2002). According to Putnam (2000), the extent to which people volunteer or take part in neighborhood activities is considered social capital. In other words, participation in such activities is an investment in social capital. Therefore, the economic conditions with which people are confronted are thought to have an influence on health outcomes, through social capital accumulation. Consideration of the constraints under which people make a decision to accumulate social capital would be important when analyzing the effects of social capital on health.

An individual's gender might be related to their health, which is influenced by socio-economic and cultural conditions (Zellner et al., 2004; Chrzanowska et al., 2007). In Japan, males are more likely to have a job than females, and this appears to make a difference in the amount of time allocated for social capital accumulation[2]. As a consequence, accumulation of social capital effects is thought to differ between genders, partly due to the labor market condition[3]. Hence, it seems plausible that the market condition results in different health status between genders through social capital accumulation. Few researchers, however, have attempted to investigate empirically the extent to which the condition of the labor market is associated with social capital and health status. This paper aims to examine these relationships by using individual level data from a Japanese sample, and employing two-stage estimations to control for

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[1] Folland (2006; 2008) constructed the theoretical economic model connect social capital with health.

[2] As a result of improvements in employment opportunities for females in Japan, females tend to increase their influence on modern social behaviors such as smoking at workplaces in Japan, which seems to affect general health status (Yamamura 2007).

[3] In Japan, social capital makes a greater contribution to decreased suicide in females than in males because the degree of females' social involvement in neighborhoods is higher than males' (Yamamura 2009).

endogeneity bias of social capital.

The organization of the remainder of this paper is as follows: In section 2, the data, method of analysis and estimation strategy are described. The results of the estimation and their interpretation are provided in section 3. The final section offers concluding remarks.

2. Data and Methods

2.1. Data

This paper used individual-level data including self-rated health status, demographics (age and sex), economic status (occupation, income, experience of bankruptcy), social capital index, years of living at current address, and location of residence[4]. Data were from the Social Policy and Social Consciousness (SPSC) survey, which was conducted in all parts of Japan in 2000. 5000 adults (aged 20 years old or older) were invited to participate in a survey with stratified two-stage random sampling. The survey collected data on 3991 adults from 11 areas, meaning that the response rate was 79.8 %[5] . The sample was divided into 4 groups according to population size of cities and towns, as follows: 13 metropolitan cities, cities with 200,000 people or greater, cities with 100,000 people or greater, and towns and villages.

Table 1 includes variable definitions, means and standard deviations. The dependent variable, self-rated health status, was measured using the question "How would you describe your current health during the past three months?" Response categories ranged from 0 (not good) to 4 (very good). Following the discussion of Putnam (2000), the degree of civic engagement is considered as social capital in this research. Social capital was measured using the question "Are you actively involved in activities of your neighborhood association?" Response categories ranged from 0 (not at all) to 3 (yes, actively involved).

2.2. Hypothesis

Table 2 (1) shows that the rate of having a job for males (80.1%), is higher than for females (55.0%). Table 2 (2) also shows that social capital of individuals without a job is greater than those with a job. This difference is statistically significant at the 1 % level.

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[4] The data for this secondary analysis, "Social Policy and Social Consciousness survey (SPSC), Shogo Takekawa," was provided by the Social Science Japan Data Archive, Information Center for Social Science Research in Japan, Institute of Social Science, The University of Tokyo.

[5] Respondents did not answer all questions; therefore, the sample size for regression estimations is 3075.

My conjecture is that people without a job appear to have more time to invest in social capital than those with a job. The above observations lead me to expect that females are more inclined to accumulate social capital than males. In addition, it is found that social capital is related to improved health status (e.g., Kawachi et al., 1997, 1999; Islam et al., 2006; Petrou and Kupek, 2008). I thus raise the following hypothesis:

Hypothesis: *Females are more likely to improve their health status through accumulation of social capital than males, which can be viewed as an outcome of the market condition.*

2.3. Econometric Framework and Estimation Strategy

To test the hypothesis as presented above, I will explore how health status is affected by social capital and economic circumstances. The estimated function takes the following form[6]:

$$HEALT_{im} = \alpha_0 + \alpha_1 SC_{im} + \alpha_2 INCOME_{im} + \alpha_3 CHILDCON_{im} + \alpha_4 BANKRPT_{im} + \alpha_5 DIV_{im} + \alpha_6 MARRI_{im} + \alpha_7 AGE_{im} + \alpha_8 UNIV_{im} + \alpha_9 MALE_{im} + e_m + u_{im},$$

where $HEALT_{im}$ represents the dependent variable in resident i and city size m, α's represents regression parameters, e_m is unobservable city size specific effects controlled by dummy variables, and u_{im} represents the error term. In added to the OLS model, an Ordered Probit model is also employed, because the dependent variable is qualitative and ranges from 0 to 4.

I put focus on the results of social capital (SC), which is considered the key variable. First, with the aim of comparing the males' results with those of the females, I split the samples into male and female when estimations were conducted. Second, samples were restricted to people with a job in order to examine whether the results as above persisted if people had a job. In other words, I have attempted to examine whether the market condition results in differences in accumulation of social capital between genders.

It seems that an individual with a larger number of neighborhood friends is more likely to be involved in neighborhood activities. Therefore, the number of neighborhood friends may be correlated with the extent to which an individual is involved in neighborhood activities. Due to the limitations of these data, the number of friends cannot be incorporated into the estimation function and so is included in error term u_{im}.

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[6] It has been argued that more healthy people are more likely to have a job, resulting in endogenous bias. It is difficult to find instrumental variable to control this endogenous bias. This is why the estimated function does not include "job" as a dummy representing whether one has a job or not.

As a consequence, the endogeneity problem occurred, leading to estimation bias[7]. For the purpose of controlling for this bias, in addition to simple estimations, I employed two-stage estimations by using instrumental variables for proxies of social capital. Following the argument that homeowners are more likely to invest in social capital than renters (e.g., DiPasquale and Glaeser, 1999; Glaeser et al., 2002; Hilber, 2007), I used the homeowner dummy as an instrument for social capital. After controlling for household income, health status was not likely to depend on whether people are homeowners. Therefore, the homeowner dummy was correctly considered to be an exogenous variable and therefore could be used as an instrumental variable.

Following existing literature (e.g., Kawachi et al., 1997, 1999; Islam et al., 2006; Petrou and Kupek, 2008), social capital is considered to improve health status. Hence, the proxy for social capital (SC) is expected to yield a positive sign. Assuming that the marginal effect of social capital accumulation is increasing return to scale, the larger social capital is, the larger the elasticity of social capital with respect to health becomes. The elasticity of social capital for females is therefore predicted to be larger than for males, if females are more likely to invest in social capital. If this holds true, the following question arises: why is there a difference in social capital accumulation between genders? The difference in elasticity between genders is anticipated to disappear when samples are restricted to individuals with a job, if this difference is caused by the labor market condition rather than by other factors.

2.4. Control variables

The higher the income, the better the health status of an individual becomes, because those with high incomes can afford to maintain or improve their health status. It is likely for these reasons that INCOME will yield a positive sign. It has been found that socio-economic conditions during childhood affect health status during adulthood (Draper et al., 2008; Schilling et al., 2008). The greater the number of years spent living in poverty during childhood, the worse the adult health status becomes (Evans and Kim, 2007). In this study, childhood economic conditions were measured using the question "How would you describe your economic condition during childhood?" The responses ranged from 0 (not good) to 3 (good). The sign of CHILDCON was thus predicted to be negative. Past economic conditions were also captured by the experience of bankruptcy, denoted as BANKRPT. I expect BANKRPT to take a negative sign.

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[7] The causality between social capital and health status is ambiguous because it is reasonably argued that healthy people are more likely to take part in neighborhood activities. This may also be the reason why estimation bias occurs.

It is generally thought that marriage improves health status (Waite and Gallagher, 2000; Waite et al., 2009). Hence the sign of MARRI is predicted to be positive. On the other hand, the experience of divorce is reasonably thought to be negative psychologically and economically, so that divorce has a detrimental influence on health (e.g., Amato, 2000; Lorenz et al., 2006; Yamamura, 2009). DIV is expected to take a negative sign.

Several control variables are included to capture individual characteristics: ages, male gender dummy, and university graduation dummy.

3. Estimation Results and Interpretation

In Table 3, 4 and in the Appendix tables of A1 and A2, columns (1)-(2) show results for both genders combined. Furthermore, column (1) includes results for the whole sample; column 2 is restricted to people with a job. Columns (3)-(4) present results for males and females, respectively. Columns (5)-(6) exhibit results for males and females with a job. With the aim of comparing the magnitude of the dependent variables, the dependent and independent variables are evaluated as sample means. .Therefore, the coefficient values reported can be interpreted as elasticity in Table 3 and 4, showing results of OLS and 2SLS estimations respectively[8].

Table 3 provides results of OLS estimations. The first row reveals that the proxy for social capital shows a positive sign in each estimation; with the exception of column (6), results are statistically significant at the 1 % level. This implies that social capital contributes to improvement in health status. Comparing columns (3) and (4) with columns (5) and (6) shows that the values for SC decrease when samples are restricted to people with a job. As anticipated, people without a job are able to derive greater benefit from social capital than those with a job. However, the coefficients for all males are distinctly larger than those for all females; this was not predicted. I propose that this might be due to endogenous bias, as discussed previously.

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[8] See more details in Greene (1997, p.280).
In the linear model, $y = x'\beta + e$ the elasticity of y with respect to changes in x is

$$\gamma_k = \frac{\partial \ln y}{\partial \ln x_k} = \beta_k \left(\frac{x_k}{y} \right).$$

This value can be estimated by sample means as

$$\lambda_k = \beta_k \left(\frac{\overline{x_k}}{\overline{y}} \right).$$

The standard error of the elasticity of y, γ_k , can be calculated by the delta method (Greene, 1997, pp. 278-280).

Turning now to economic factors including INCOME, CHILDCON, and BANKRPT, I find that the signs of INCOME and CHILDCON are positive, and BANKRPT negative, in all estimations. These results are consistent with the literature. Concerning INCOME and BANKRPT, the values of the coefficients and statistical significance for males are similar to those for females. On the other hand, values of CHILDCON for females are several times larger than those for males; estimations for females are statistically significant while those for males are not significant. In addition, DIV shows the expected negative sign for females (statistically significant at the 1 % level), but shows a positive sign for males. As shown in columns (5) and (6), differences in CHILDCON and DIV results between genders are not affected when the samples are restricted to people with a job. It is thus possible that the health status of females is influenced more by socio-economic conditions such as economic condition during childhood and the experience of divorce than the health status of men. Different results concerning CHILDCON and DIV between males and females appear not to be explained by gender, but rather by labor market condition. As is shown in Table 4, Table A1 and Table A2, besides SC, OLS results for independent variables do not change when alternative estimations are employed.

Table 4 provides a closer examination of the effects of social capital on health. Examination of the last row of Table 4 reveals that HOUS yields the expected positive sign; results are statistically significant at the 1% level. In addition, results of F-statistics show the validity of the first stage estimation.

Turning our attention to the second stage results for SC allows us to examine the hypothesis. All estimation results for SC show the predicted positive sign. Examination of columns (1) and (2) of the first row reveals that the coefficient values of column (2) are about half of those in column (1), and are statistically insignificant. This suggests that controlling for endogenous bias reduced the effect of social capital when the sample was restricted to people with a job. Hence, social capital effect appears to depend on whether people have a job or not. In columns (3) and (4), it is interesting to observe that the values for females are about 7 times larger than those for males. Furthermore, the values for females are statistically significant, but those for males are not significant. These results are remarkably different from results presented in Table 3. I interpret the results obtained by OLS and 2SLS estimations as showing that endogenous bias is very large.

I now examine the differences between the OLS and 2SLS estimations more closely. It is surprising that the value for females in column (4) of Table 4 is 0.34, which is about 10 times larger than the corresponding value in Table 3 of 0.07. Furthermore,

it is interesting to observe that columns (5) and (6) indicate that there is no difference in SC between males and females. Concerning SC results overall, the different effects of social capital on health status between genders can be explained by whether people have a job or not. My conjecture about the cause of this gap between genders is as follows: Females are less likely to have a job and hence can allocate more of their spare time to interact with their neighborhood. As a consequence, females are inclined to have more friends in their neighborhood. In the estimation function, the number of neighborhood friends is not incorporated and hence is considered as an error term. It is plausible that SC is positively correlated with the number of neighborhood friends, because people with more friends are thought to be more involved in neighborhood activities. This may lead to underestimating the SC coefficient.

Table A1 (Ordered Probit estimation) and Table A2 (two-stage Ordered Probit estimation), which are presented in APPENDIX, correspond to Table 1 (OLS estimation) and Table 2 (2SLS estimation), respectively. Results concerning SC obtained by OLS and 2SLS estimations are unchanged when alternative estimations (Ordered Probit and two-stage Ordered Probit estimations) are conducted. This indicates that the SC results are robust to alternative estimations, and therefore strongly supports the hypothesis raised in the previous section.

4. Conclusion

This paper has investigated how social capital is related with self-rated health status in Japan and how these relationships are affected by gender, using individual-level data. In order to control for endogeneity of social capital, I employed a homeowner dummy as an instrumental variable for social capital and conducted two-stage estimations. The main findings are as follows:

(1) Social capital has a significant positive influence on health status for females but not for males.

(2) If samples are limited to persons with a job, social capital effects drastically decrease and the difference between genders diminishes.

The positive effects of social capital on health are limited by the time allocated to invest in social capital. Assuming that the marginal effect of social capital accumulation is increasing return to scale, time constraints would be important. This empirical study provides evidence that people without a job can allocate time to accumulate social capital and thereby improve their health status. This is considered to be a positive labor market externality. Admittedly, worsening labor

market conditions lead to reduced mental health, especially for less-educated people, who may have a difficulty in finding a job (Charles and Decicca, 2008). A clear finding from this investigation is that social capital, to some extent, serves as a safety net for people who are less likely to find a job. If this is the case, social capital may compensate for market imperfections (Hayami, 2001). These results regarding labor market externalities have policy implications.

The present research was limited to Japan, and the sample size of subjects used in the analyses was small. As such, the findings provided thus far cannot be generalized to other countries. To increase the generalizability of the results presented here, a comparable study of other countries with different socio-cultural backgrounds should be conducted, using a larger sample size. These are remaining issues to be addressed in future studies.

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Table 1

Variable definitions and descriptive statistics

Variables	Definition	Mean	Standard deviation
HEALTH	The degree of self-rated general health status ranges from 0 (poor) to 4 (very good).	2.80	1.07
SC	The degree of involvement in activities of neighborhood associations ranges from 0 (not at all) to 3 (actively involved).	1.35	0.95
INCOME	Household income [a]	652	419
CHILDCON	Economic condition during childhood ranges from 0 (poor) to 3 (very good).	1.25	0.89
BANKRPT	Value is 1 if respondent or spouse has experienced bankruptcy during these three years, otherwise value is 0.	0.18	0.39
DIV	Value is 1 if respondent has experienced divorce, otherwise value is 0.	0.03	0.17
MARRI	Value is 1 if respondent has a spouse, otherwise value is 0.	0.75	0.43
AGE	Age in years	49	15
UNIV	Value is 1 if respondent graduated from university, otherwise value is 0.	0.15	0.36
MALE	Value is 1 if male, 0 if female.	0.47	0.49
HOUS	Value is 1 if respondent is a homeowner, otherwise value is 0.	0.76	0.42

[a] Million yens

Table 2

Social capital and labor market condition

(1) Comparison of having a job between genders (%)

	Male	Female
People with job	80.1	55.0

(2) Comparison of social capital between people with jobs and those without jobs.

	People with jobs	People without jobs	t-value
SC	1.33	1.44	2.54 **

** indicates significance at 1 percent level.

Table 3

Determinants of self-rated health (OLS model)

Variables	(1) *ALL*	(2) *ALL with a job*	(3) *MALE*	(4) *FEMALE*	(5) *MALE with a job*	(6) *FEMALE with a job*
SC	0.05**	0.04**	0.07**	0.03**	0.06**	0.008
	(5.40)	(3.62)	(5.36)	(2.43)	(4.31)	(0.47)
INCOME	0.05**	0.04**	0.07**	0.04**	0.04**	0.03*
	(5.40)	(3.44)	(4.68)	(2.84)	(2.65)	(1.96)
CHILDCON	0.01*	0.01*	0.004	0.03*	0.006	0.03*
	(1.87)	(1.65)	(0.37)	(2.21)	(0.55)	(1.87)
BANKRPT	-0.01**	-0.01**	-0.01*	-0.01**	-0.008*	-0.01**
	(-3.17)	(-3.36)	(-2.10)	(-2.44)	(-1.99)	(-2.95)
DIV	-0.001	-0.004**	0.001	-0.005**	0.0001	-0.009**
	(-1.27)	(-2.48)	(0.95)	(-2.37)	(0.01)	(-2.93)
MARRI	0.02*	0.0005	0.04*	0.007	0.005	0.004
	(1.69)	(0.03)	(1.96)	(0.34)	(0.26)	(0.20)
AGE	-0.26**	-0.11**	-0.24**	-0.29**	-0.13**	-0.09*
	(-11.5)	(-3.96)	(-7.17)	(-8.49)	(-3.64)	(-1.92)
UNIV	0.002	-0.001	0.002	0.002	0.0003	-0.002
	(0.71)	(-0.33)	(0.05)	(0.73)	(0.07)	(-0.63)
MALE	0.01**	0.01*				
	(2.88)	(2.07)				
City size[a]	YES	YES	YES	YES	YES	YES
Adj R- square	0.07	0.03	0.07	0.07	0.02	0.03
Sample size	3075	2111	1537	1538	1250	861

Numbers show elasticity. Numbers in parentheses are t-statistics. * and ** indicate significance at 5 and 1 per cent levels, respectively (one-sided tests). A constant term was included when the estimation was conducted (results not reported).

[a] YES means that dummy variables are included in order to control for city size specific effects.

Table 4

Determinants of self-rated health (2SLS model)

Variables	(1) *ALL*	(2) *ALL with a job*	(3) *MALE*	(4) *FEMALE*	(5) *MALE with a job*	(6) *FEMALE with a job*
SC	0.20*	0.09	0.05	0.34*	0.08	0.08
	(2.07)	(1.07)	(0.40)	(2.20)	(0.84)	(0.52)
INCOME	0.05**	0.04**	0.07**	0.04**	0.04**	0.04*
	(4.85)	(3.44)	(4.46)	(2.51)	(2.56)	(1.96)
CHILDCON	0.01*	0.01*	0.004	0.03*	0.007	0.02*
	(1.97)	(1.65)	(0.34)	(2.10)	(0.59)	(1.67)
BANKRPT	-0.01**	-0.01**	-0.01*	-0.01*	-0.008*	-0.01**
	(-3.05)	(-3.35)	(-2.07)	(-1.94)	(-2.00)	(-2.86)
DIV	-0.001	-0.003**	0.001	-0.006**	0.0001	-0.01**
	(-1.24)	(-2.40)	(0.87)	(-2.55)	(0.08)	(-2.94)
MARRI	-0.003	-0.009	0.04	-0.06	0.002	-0.01
	(-0.15)	(-0.41)	(1.53)	(-1.47)	(0.09)	(-0.31)
AGE	-0.33**	-0.14**	-0.23**	-0.44**	-0.15*	-0.13
	(-6.32)	(-2.57)	(-3.23)	(-5.17)	(-2.31)	(-1.24)
UNIV	0.003	-0.003	0.002	0.002	0.001	-0.002
	(1.11)	(-0.08)	(0.37)	(0.61)	(0.16)	(-0.49)
MALE	0.02**	0.01*				
	(2.90)	(2.02)				
City size[a]	YES	YES	YES	YES	YES	YES
Adj R- square	0.01	0.02	0.06	0.06	0.02	0.01
Sample size	3075	2111	1537	1538	1250	861
First stage estimation for SC						
HOUS	0.25**	0.28**	0.24**	0.25**	0.30**	0.24**
	(6.14)	(5.70)	(4.12)	(4.42)	(4.74)	(3.15)
F-statistics	29.2	22.0	17.4	14.6	13.9	10.2

Numbers show elasticity. Numbers in parentheses are t-statistics. * and ** indicate significance at 5 and 1 per cent levels, respectively (one-sided tests). A constant term was included when the estimation was conducted (results not reported). To save space, only the HOUS results are reported for the first stage estimations.

[a] YES means that dummy variables are included in order to control for city size specific effects.

APPENDIX

Table A1

Determinants of self-rated health (Ordered Probit Model)

Variables	(1) *ALL*	(2) *ALL with a job*	(3) *MALE*	(4) *FEMALE*	(5) *MALE with a job*	(6) *FEMALE with a job*
SC	0.11**	0.10**	0.16**	0.07**	0.15**	0.02
	(5.37)	(3.68)	(5.28)	(2.40)	(4.31)	(0.53)
INCOME	0.25**	0.21**	0.31**	0.18**	0.22**	0.19*
	(5.11)	(3.60)	(4.52)	(2.56)	(2.77)	(2.07)
CHILDCON	0.04*	0.04*	0.01	0.07**	0.02	0.07*
	(2.06)	(1.74)	(0.51)	(2.38)	(0.75)	(1.86)
BANKRPT	-0.16**	-0.21**	-0.15*	-0.17**	-0.16*	-0.28**
	(-3.21)	(-3.40)	(-2.15)	(-2.46)	(-1.99)	(-3.05)
DIV	-0.14	-0.29*	0.15	-0.33*	-0.001	-0.46**
	(-1.27)	(-2.24)	(0.78)	(-2.24)	(-0.01)	(-2.67)
MARRI	0.06	-0.02	0.11	0.02	-0.004	0.001
	(1.24)	(-0.31)	(1.36)	(0.34)	(-0.04)	(0.01)
AGE	-0.01**	-0.008**	-0.01**	-0.01**	-0.01**	-0.007*
	(-10.8)	(-4.22)	(-6.84)	(-8.42)	(-3.72)	(-2.20)
UNIV	0.04	-0.02	0.03	0.08	0.008	-0.09
	(0.78)	(-0.33)	(0.52)	(0.81)	(0.11)	(-0.76)
MALE	0.11**	0.10*				
	(2.81)	(2.17)				
City size[a]	YES	YES	YES	YES	YES	YES
Pseudo R- square	0.02	0.01	0.02	0.03	0.01	0.02
Sample size	3075	2111	1537	1538	1250	861

Numbers in parentheses are z-statistics. * and ** indicate significance at 5 and 1 per cent levels, respectively (one-sided tests).

[a] YES means that dummy variables are included in order to control for area specific or city size specific effects.

APPENDIX

Table A2

Determinants of self-rated health (two-stage Ordered Probit Model)

Variables	(1) *ALL*	(2) *ALL With a job*	(3) *MALE*	(4) *FEMALE*	(5) *MALE with a job*	(6) *FEMALE with a job*
SC	0.38*	0.21	0.13	0.59*	0.22	0.17
	(1.92)	(0.99)	(0.45)	(2.17)	(0.85)	(0.44)
INCOME	0.24**	0.21**	0.32**	0.18**	0.21**	0.21*
	(4.75)	(3.62)	(4.27)	(2.53)	(2.69)	(2.04)
CHILDCON	0.05*	0.04*	0.01	0.07**	0.03	0.07*
	(2.19)	(1.74)	(0.49)	(2.50)	(0.78)	(1.70)
BANKRPT	-0.16**	-0.21**	-0.15*	-0.16*	-0.16*	-0.28**
	(-3.17)	(-3.41)	(-2.11)	(-2.22)	(-2.00)	(-3.00)
DIV	-0.15	-0.29*	0.14	-0.40**	0.01	-0.47**
	(-1.28)	(-2.18)	(0.71)	(-2.66)	(0.06)	(-2.70)
MARRI	-0.02	-0.05	0.12	-0.18	-0.01	-0.06
	(-0.27)	(-0.58)	(1.06)	(-1.40)	(-0.16)	(-0.32)
AGE	-0.01**	-0.01**	-0.01**	-0.02**	-0.01**	-0.01
	(-6.24)	(-2.64)	(-3.13)	(-5.50)	(-2.36)	(-1.30)
UNIV	0.06	-0.008	0.03	0.07	0.01	-0.08
	(1.14)	(-0.12)	(0.40)	(0.77)	(0.19)	(-0.64)
MALE	0.11**	0.10*				
	(2.88)	(2.13)				
City size[a]	YES	YES	YES	YES	YES	YES
Pseudo R- square	0.02	0.01	0.02	0.03	0.01	0.02
Sample size	3075	2111	1537	1538	1250	861
First stage estimation for SC						
HOUS	0.25**	0.28**	0.24**	0.25**	0.30**	0.24**
	(6.14)	(5.70)	(4.12)	(4.42)	(4.74)	(3.15)
F-statistics	29.2	22.0	17.4	14.6	13.9	10.2

Numbers in parentheses are t-statistics and z-statistics for the first stage and second stage estimations. * and ** indicate significance at 5 and 1 per cent levels, respectively (one-sided tests). A constant term was included when the first stage estimation was conducted (results not reported). To save space, only the HOUS results are reported for the first stage estimations.

[a] YES means that dummy variables are included in order to control for area specific or city size specific effects.